REMARKS

Claims 1-23 are pending in this application.

Claims 18-23 are withdrawn from consideration.

Claims 1-17 are rejected.

Claims 1-17 are rejected under 35 USC 102(b) as being anticipated by a report entitled "Lab Testing of Neural Networks for Improved Aircraft Onboard Diagnostics on Flight-Ready Hardware" by Raymond Anderson ("Anderson").

Anderson describes a rule-based system for diagnosing intermittent subsystem faults within an aircraft while the aircraft is in flight. The rule-based system identifies a failure by finding the "right combination of related data facts which occur when the failure is present" (page 404, section 2). The relevant data may include such information as maneuver g's, bank angle, temperature, or hydraulic pressure.

Anderson also describes a neural-network (NN)-based system for identifying control surface damage, and using that information to reconfigure remaining flight control surfaces to restore safe flying (page 404, section 1). The neural network creates causal relationships between training data and known problems (p. 406, section 3). The NN-based system includes a "fault isolation neural network" for diagnosing intermittent subsystem faults within an aircraft while the aircraft is in flight.

The NN-based system further includes a "damage detection neural network" for identifying damaged aircraft components that will enable control reconfiguration to restore flight control. The damage detection neural network may also be used as a fault recording system.

The damage detection neural network may be trained and tested only on actual flight data (p. 408, section 5). In one particular example, the flight data "contained episodes of stabilator damage and episodes of no damage." Other sources of training data are listed at the end of section 6: systems integration bench test, flight component

avionics and hydraulic test, flight simulation test, subsystem qualification test, initial flight test, failure mode effects analysis, and built-in test development test.

Claim 1 has been amended to recite the processing of component operating parameters and system-level health to determine component health. The processing includes "performing principal component analysis (PCA) to provide a reduced set of data, and using the reduced set to determine a health assessment parameter for the component." Support for this feature can be found in Figure 4 of the application.

Anderson does not teach or suggest such processing. Therefore, amended claim 1 should be allowed over Anderson.

Claims 2-8 have been cancelled, and claims 9-13 have been amended to depend properly from amended claim 1. Dependent claims 2-17 should also be allowed for the reason above.

Withdrawn claim 19 has been amended to depend from claim 1, and claims 20-21 and 23 have been amended to depend properly from claim 19. Amended claim 19 recites using eigenvalues computed from the PCA to determine the health assessment parameter. Anderson does not teach or suggest this feature. For this additional reason, amended claim 19 and its dependent claims 20-23 should be allowed over Anderson.

If the Examiner has any questions or wishes to further discuss this application, he is encouraged to contact the undersigned.

Respectfully submitted,

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